

CMS Heavy-Ions: status & news

Biweekly CMS-HI West Meeting

CERN, 12th Dec. 2008



David d'Enterria

Olga Kodolova



LHC: machine status

- Removing of 42 dipoles + 15 quads (24 dipoles & 5 quads actually damaged) in Sec. 3-4 started. Brought to surface before Christmas shutdown for exchange or cleaning/insulation-exch.
- Test bench for cold testing is the limiting factor: capacity to be ramped up to 18 kW-plant (now 6 kW) in Feb. 2009. Installing first (spares) dipoles now (20 dipoles back by Christmas). Last magnet back in end of March'09.
- Optimistic plan: Machine cold again in July. Beam: end of July'09
Energy/Luminosity on the conservative side to minimize risks.
- Other activities not on the critical path: work on flanges, relief valves, cabling. Cavern access: under Safety Commission.

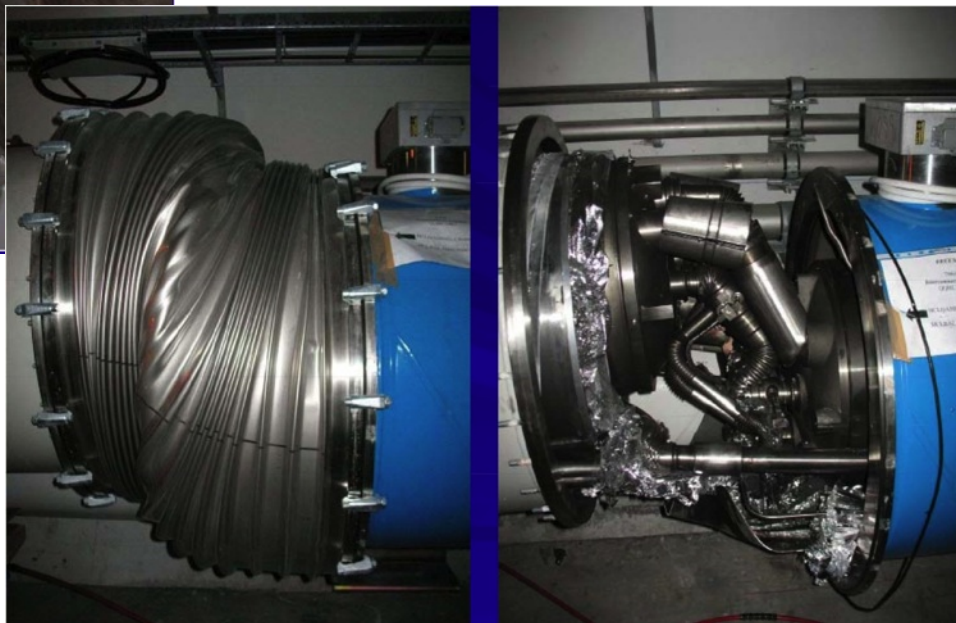
LHC: machine status

From R. Aymar presentation,
Plenary ECFA, 28/11/08

Crunched interconnects



Broken anchors to floor concrete





2009 Meetings

- Physics days and Physics weeks (and CMS weeks) on the Web (on the Physics page)

Feb 2-6

Mar 16-Mar 20

May 11-15

Jun 22-26

Jul 27-31

Sep 7-11

Oct 19-23

Dec 7-11

Physics Days

CMS week

Physics/Trigger week

CMS week

Physics Days

Physics/Trigger week (@ Bologna)

Physics Days

CMS week

- Feb Physics Days: will include a half-day “workshop” organized by the stats committee on “strategies/issues/problems related to discovery analyses”



2009 Schedule

1) Maintenance & Operation

Services available

Install ES1

Install ES2

Tracker Cooling Plant Operational

Close CMS

Contingency on closure or CRAFT

CRAFT

CMS READY for Beam

2) Soft., Comp & Physics Analysis

Fullsim (CMSSW2.2.x), then Fastsim

Release CMSSW3_0
(limited validation, step towards 3_1)

End-Feb: Input for 3_1:
CRAFT results, Trigger Review (menu) etc.

Release CMSSW3_1 (LHC Startup)

Full validation of 3_1 (incl.
production and physics)

Start Fullsim production 3_1

Deploy 3_1 widely
CMS gets familiar with 3_1

Start Fastsim

CMS READY for Beam

Dec

Jan

Feb

Mar

Apr

May

Jun

Jul

Aug

Sep





Physics priorities: next 6 months

- Main goals:
 - update our existing results for 10 TeV, new software, 3.8 T, new geometry, all the new code
 - Complete and extend some of our results
 - Complete trigger reviews
 - Extend use of PAT.
 - Write first-papers drafts.
- We have asked that 3_X be delayed in order to allow us to work with 2_2 samples (avoid endless cycle of release-validate-produce)
- Now 3_1 will arrive in April
 - From June onwards we want to concentrate on validating the 3_1 samples and prepare for the beam



Validation (code, samples, people...)

- Many “physics bugs” found in the most recent CMSSW “ready for production”, and en route to “getting Summer08 samples”.
- We need a proper validation process with
 - fast turnaround
 - explicit responsibilities
 - good logging of problems (and permanent advertising) and of course fixing
- Obviously, this validation has to include trigger, offline, DPGs and physics groups.
 - In steady-state: we must be testing the full end-to-end chain
- This will be a major ingredient in ensuring our ability to understand our data quickly
 - Currently: discussing options for how to do the above with DPG/Commissioning Coord., the DQM group, and Offline et al
 - We are aiming at putting something together early next year



Triggers & datasets

- The details of the **trigger menu** are now on center stage
- **Highest priority** between now and early 2009: complete the trigger review.
 - We had the **first “physics object” review on Jets and MET yesterday**
 - It was successful. The POG (JetMET) presented a “core menu” for jets and MET; the PAGs that rely on these triggers followed with possible additions to this core menu
 - **Next week: egamma and muons**
 - In **January: finish off the review** – hope to have the new trigger tables in place by the close of CMSSW_3_1
- Major part of this: formation of **first set of datasets**.
 - Test this (to the extent possible) with the 2_2 production
 - Fastsim: hopefully, its large statistics will help as well



Trigger review process (I)

- Proposed core 8E29, 1E31 menus for the Trigger Reviews announced at https://twiki.cern.ch/twiki/bin/view/CMS/TSG_24_XI_08
- Base to which PAGs/POGS are asked (=review) the justification of any other new triggers wrt. this basic set of triggers at 2 (3) lumis.
- New (POG-based) calendar of reviews in TSG Meetings:
 - CMS week (day TBD): JetMET
 - **Mon Dec 15:** **Muons**
 - Wed Dec 17: Egamma
 - Mon Jan 12: b-tag/tau/p-flow
 - Wed Jan 21: Cross-triggers
 - Mon Jan 26: AlCa/MinBias/Commissioning triggers.
- Reviews are a 1st pass: some triggers get included immediately, others will have more study requested (follow-up review), others will be rejected



Trigger review process (II): dimuon trigger

■ CMS-HI actions:

- Priority p-p trigger: **low-pT dimuons**.
- HI-PAG & Muon-POG & B-phys-PAG conveners meet before CMS-week
- Ji-Hyun & Dong Ho: prepare status report.

■ Calendar:

- Mo. 24th Nov: **Core 8E29, 1E31 trigger** menus **announced**
- Wed. 3rd Dec: CMS-HI **meeting with Muon-POG & B-physics-PAG & TSG experts in 40-2A-01 (18:00-19:00)**
- Mo. 15th Dec: **Muons Trigger review** (note it overlaps with MC workshop ...)
Ji Hyun and Dong Ho preparing presentation + 1-2 summary slides
for general Muon trigger talk: <http://indico.cern.ch/conferenceDisplay.py?confId=47232>



Trigger review process (III): dimuon trigger

- **Meeting** with Muon-POG & B-physics-PAG conveners & representatives (~10 people total) last **Dec. 3rd**:
 - Presentation of **CMS-HI proposal** by Ji-Hyun & Dong-Ho:
<http://indico.cern.ch/conferenceDisplay.py?confId=46798>
 - In a nutshell: **Include DoubleMu0** into trigger menu to collect low- p_T J/Psi (at $y \sim 2$: $p \sim 3$ GeV $\Leftrightarrow p_T \sim 1$ GeV/c)
- Muon-POG and B-physics groups **support this activity**:
 - They took note and will include our proposal in their trigger-review defense (1 Muon-POG presentation scheduled).
 - We will **coordinate Muon trigger-review** on 15th Dec.



Trigger review process (IV): dimuon trigger

ACTION ITEMS (Mainly for Ji-Hyun/Dong-Ho):

- Interact with Marcin for **L1--> L3 chain**
- Communicate with Zoltan for **new version of L3** (too low effic.now)
- Calculate **expected** accumulated **statistics** with different lumis (i.e. pre-scale) scenarios. (Match $2 \cdot 10^5$ J/Psi from Pb-Pb ?)
- Calculate **bckgd & signal** rates for various energies: **900 GeV, 5.5 TeV, 10 TeV**
- Plan how to extract **trigger efficiency from data** (use overlapping of the different trigger bits). Which fraction of rate for doubleMu is already triggered by SingleMu3 in minbias (not by signal) ?
- Evaluate what **Primary Dataset** can be considered to store the stream.



Monte Carlos Workshop (15-16th Dec)

“CMS Advanced MC Use & Tuning Strategies Workshop”

- 2-days workshop on modern MC use in CMS & strategies for tuning with data: Dec. 15th -16th. CERN Bldg 40: 40-SC-01
- **CMS-only**: Mostly intended for people doing analysis in our collaboration
- Not to review MC generators but to **spread the know-how on modern generation tools in the CMS analyses**:
 - State-of-the-art of the tools used in CMS (and not only).
 - Interact with the authors of the generators.
 - Tutorials. Learn how to generate your events yourself, and to implement new models where possible.
- Start discussion of MC **tuning with data** and treatment of modeling **uncertainties** in the analyses. Expect all PAGs and POGs to be adequately represented.



Monte Carlos Workshop (15-16th Dec)

<http://indico.cern.ch/conferenceDisplay.py?confId=45291>

Tuesday 16 December 2008

[top](#)

09:00->10:30 MC Tuning (Convener: Paolo Bartalini (CERN))

09:00	What to tune in MC generator and why (20)	Paolo Bartalini (NTU)
09:20	Tunings from Tevatron to the LHC: UE-MB and MPI (20)	Richard D. Field
09:40	Tunings at the Tevatron: PS, ME-PS matching (20)	TBA
10:00	CEDAR tools (20)	Hendrik Hoeth (Bergische Universitaet Wuppertal)
10:20	discussion (10)	
10:30	coffee	

11:00->12:40 PDF and Theory uncertainties (Convener: Stephen Mrenna (FERMILAB) , Roberto Chierici (CNRS/IN2P3))

11:00	Introduction to the treatment of theoretical uncertainties (20)	Stephen Mrenna (FERMILAB)
11:20	PDF use in MC generators (20)	Robert Thorne (UCL)
11:40	LHAPDF & LHAPDF in CMSSW (20)	Carsten Hof (AACHEN)
12:00	Modeling uncertainties in the Tevatron analyses (20)	TBA
12:20	discussion (10)	
12:40	lunch	

14:00->15:50 Other SM tools (Convener: Monika Grothe (U Wisconsin) , David d'Enterria (CERN))

14:00	kT-factorization-based Monte Carlos (20)	Michal Deak (CERN)
14:20	Monte Carlos for parton energy-loss in heavy-ion collisions (20)	Carlos Albert Salgado Lopez (CERN TH Division)
14:40	Single diffraction and hard color singlet exchange processes (20)	TBA
15:00	Central exclusive production (20)	Andrew Pilkington
15:40	discussion (10)	
15:50	coffee	

Second day:

- Monte Carlo tunings, syst. uncertainties, PDFs
- Forward and HI Monte Carlos
- Validation, particle properties, framework

Jet quenching MCs (C.Salgado)

16:20->18:20 MC validation, particle properties and framework

(Convener: Avto Kharchilava (SUNY at Buffalo) , Todd Adams (Department of Physics, B-159 - Florida State University))

16:20	MC validation in CMS, tools and results (30)	Avto Kharchilava (SUNY at Buffalo)
16:50	Particle properties in MCs (20)	Peter Richardson (Durham University)
17:10	Particle properties in CMS and interface to simulation (20)	Todd Adams (Department of Physics, B-159 - Florida State University)
17:30	EvtGen in CMSSW and its validation (20)	Roberto Covarelli (CERN)
17:50	Status of the CMSSW GeneratorInterface and future plans (20)	Julia Yarba (Fermilab)
18:10	discussion (10)	



Russian Tier2 to T1s certification

- All **T2_RU** links certified with **T1_CH_CERN**.
- New links certified:
 - T1_DE_FZK->T2_RU_JINR**
 - T1_US_FNAL->T2_RU_RRC_KI**
 - T1_US_FNAL->T2_RU_SINP**
 - T1_FR_CCIN2P3->T2_RU_JINR**
- On-going certification (with help of CCIN2P3 team):
 - T1_FR_CCIN2P3->T2_RU ITEP**



CMS-HI Physics Analyses: CADI

■ **CADI:** <http://cms.cern.ch/iCMS/analysisadmin/analysismanagement>

Actions	Code	URL	HN	Status	Contact	ARC_Members	IRC_Readers	PAS	Targets
Call PREAP Go App Note Rel AN Edit Del	HIN-07-001 MC	www	hn	AWG	D. Dutta Change	show 3 members	new IRC		show
Samples: SUMMER07 AN Notes: 2007/050(Detach)									
Update Note Rel AN Gen AL Edit Del	HIN-07-002 MC	www	hn	PAS-PUB	C. Loizides Change	show 3 members	new IRC		show
<i>Analysis of the photon-tagged jet events in HE heavy-ion collisions (Remarks: Material to be shown at QM'08 conference (4-10th Feb'08). Heavy-Ion MC samples.)</i> Samples: SUMMER07 AN Notes: 2007/051(Detach)									
Note Rel AN Edit Del	HIN-07-003 MC		hn	Started	A. Iordanova Change	in progress	new IRC		show
<i>Level-1 Triggering studies for Heavy-Ion collisions at $\sqrt{s_{NN}}$ ~ 5.5 TeV in CMS</i> Samples: SUMMER07 AN Notes: 2007/053(Detach)									
Note Rel AN Edit Del	HIN-07-004 MC		hn	Started	Y. Yilmaz Change	show 3 members	new IRC		show
<i>Determination of Pb-Pb Event Centrality Using CASTOR and HF Calorimeters in CMS</i> Samples: SPRING07 AN Notes: 2007/054(Detach)									
Call PREAP Go App Note Rel AN Edit Del	HIN-07-005 MC	www	hn	AWG	P. Shukla Change	new ARC	new IRC		show
<i>B-meson Production via J/Psi in Heavy-Ion collisions</i> AN Notes: 2007/056(Detach)									
Note Rel AN Edit Del	HIN-07-006 MC		hn	Inactive	G. Sood Change	new ARC	new IRC		show
<i>B-jet tagging studies in Heavy-Ion collisions</i>									
Call PREAP Go App Note Rel AN Edit Del	HIN-08-001 MC	www	hn	AWG	A. Mohanty Change	new ARC	new IRC		show
<i>This analysis is an extension/update of CMS-AN-2006-107</i>									
Call APP Note Rel AN Edit Del	HIN-08-002 MC	www	hn	ARC	D. Moon Change	show 3 members	new IRC		show
(Remarks: This analysis is update and extention of CMS AN 2003-002) AN Notes: 2008/055(Detach)									
Call PREAP Go App Note Rel AN Edit Del	HIN-08-003 MC	www	hn	AWG	C. Mironov Change	new ARC	new IRC		show
Note Rel AN Edit Del	HIN-08-004 MC		hn	Started	P. Allfrey Change	new ARC	new IRC		show

Please inform us of any change of status of analysis



Quark Matter 2009 – Knoxville (US)

■ QM'09 (21st Int. Conf.) in **Knoxville (Tennessee)**:

■ Important Dates:

Abstract submission deadline	Dec. 15, 2008
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Final Announcement	Jan. 15, 2009
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Deadline for early registration fee of \$500	Jan. 31, 2009
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Hotel reservation discount deadline	Feb. 28, 2009
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Student Day	March 29, 2009
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Quark Matter 2009 Conference	March 30 – April 4, 2009
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■ QM'09 talks: **1 plenary (sure) + Parallel-talks/Posters chosen based on abstract quality.** So far:

Talks: “Heavy-Ions Physics with CMS” (Olga/Christof), “CASTOR” (Apostolos), “Fwd jets (p-p) & low-x QCD” (DdE), “High-pT” (?), “ZDC” (...)

Posters: J/Psi trigger p-p (Ji-Hyun)&Pb-Pb (Dong-Ho), “UPC Upsilon” (Vineet)...

■ Very few days left ! Interested people **contact conveners & Bolek:**

https://cms-mgt-conferences.web.cern.ch/cms-mgtconferences/conferences/conf_display.aspx?cid=114



Conferences 2008

■ Important to have maximum visibility in 2008. Exploit new work/analyses, ...

See: https://cms-mgt-conferences.web.cern.ch/cms-mgt-conferences/conferences/conf_listing.aspx

(also: <https://twiki.cern.ch/twiki/bin/view/CMS/HiConferences2008>)

- **Proceeds: LHC2008-Split** (Olga – circulated, Ferenc, Yen-Jie, Vasu, < 20th Dec),
SQM08 (B.Hong, CR submitted), **PANIC08** (L. Sarycheva, deadline Jan'09)
PLEASE CIRCULATE draft within CMS-HI !

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- **WWND'09** (Montana, 1-9 Feb.'09): 1 single gen. CMS-HI talk (Bolek W.)
 - **High-pT-LHC** (Prague, 4-7 Feb. 09): 1(gen.) and/or 1(specific) talks. Candidates ?
 - **QM'09** (Knoxville, March-Apr.'09): 1(gen.) + 3 (specific) talks + 10 posters.



Plan for today/next meetings

- Status report on A-A software: GEN-SIM-RECO-PROD
- Status report on A-A L1 and HLT & DAQ
- Status reports on p-p analysis: charged hadron spectra
- Status reports on PbPb physics objects: gamma,jets
- Status reports on PbPb analysis: dihadron azimuthal correlations
Z+jet
- Detector status: ZDC,CASTOR
- Theory: elliptic flow in p-p, multi-parton interactions (p-p)
- Next meeting ? Friday 19th Dec, 10:00 or 16:30 (GVA) – need to decide now.

<https://twiki.cern.ch/twiki/bin/view/CMS/CaLENDAR>

Backup slides



Focus physics plan for next 6 months

- **Update key results for p-p at 10 TeV.**
- Announcement sent that **1_6 is over**, 2_1 and 2_2 are on.
- Most of analyses are set to **go now with 2_1**.
- If you need **p-flow**, you need to **wait for 2_2**.
- **Fastsim**: aim to have it by the return in Jan



Jan-Feb: physics approvals plan

- Feb 1: Aspen
 - Approval “as late as possible”: Wed Jan 29 +/-X days
 - Expect only tail of CSA07 re-approvals (e.g. Higgs)
 - Keep Jan 15 free. Pressure to complete the trigger reviews early (comes from CMSSW 3_0)
- Mar 1: Moriond/La-Thuille (3 weeks)
 - Avoid last-minute approvals (cannot avoid this for Aspen) so aim for weeks of approvals in Feb 11 and Feb 18.
 - Latest pre-approval dates (allowing one week for the ARC to act/decide): Jan 21 and 28



Triggers review process (II)

- Each trigger should be provided with **emulation code in OpenHLT** & coded in the **PAT** for matching of objects to the trigger primitives.
- Each physics trigger requires a clear description that:
 - **Details** its purpose & strategy.
 - Exact **physics signal(s)** that trigger is designed to capture.
 - How it is **implemented**
 - **People**/group/institution maintaining, supporting, responding.
 - **Primary Dataset** with which trigger is associated as well as skims & Express Line selection, if any.
 - Range of **luminosities** for which it is intended: 10^{30} , 10^{31} or 10^{32} onwards



Triggers review process (III)

- More details (conditions to include new trigger in offic. menu):
 - **List of responses** (i.e. possible changes to requirements or thresholds) to a factor three higher QCD rate (e.g. from a K-factor).
 - **Efficiency, purity & acceptance** of the trigger for Monte Carlo truth signal events not already triggered on by the existing triggers vs. E_T threshold, η & other isolation criteria.
 - The **additional rate** of this trigger beyond that already triggered by existing triggers vs. E_T , η and other isolation criteria.
 - Demonstration of smooth trigger relaxation of conditions (e.g. isolation) with increasing E_T threshold.
 - The list of triggers used to **monitor performance**, the samples required, & the plots that provide the performance measurement both online&offline.
 - If this is a "safety/backup trigger" (e.g. using strip isol. instead of pixel isol.), comparisons of performance should be made against "reference" trigger.



Startup Core Menu for 8 x 10²⁹

- **20 "physics" triggers:**

- HLT_DiJetAve30
- HLT_DoubleEle10_LW_OnlyPixelM_L1R
- HLT_DoubleEle5_SW_L1R
- HLT_DoubleLooselsoTau
- HLT_Ele10_SW_L1R
- HLT_FwdJet20
- HLT_IsoPhoton10_L1R
- **HLT_Jet30**
- **HLT_Jet50**
- **HLT_Jet80**
- HLT_L1Jet15
- HLT_L1MET20
- HLT_L1Mu
- HLT_L1MuOpen
- HLT_L2Mu9
- HLT_LooselsoTau_MET30
- HLT_LooselsoTau_MET30_L1MET
- HLT_MET35
- HLT_Mu3
- HLT_Photon15_L1R

- **6 "min.bias" triggers:**

- **HLT_ZeroBias**
- **HLT_MinBias**
- **HLT_MinBiasHcal**
- **HLT_MinBiasEcal**
- **HLT_MinBiasPixel**
- **HLT_MinBiasPixel_Trk5**

- **3 AlCaRAW triggers:**

- AlCa_EcalPhiSym
- AlCa_EcalPi0
- AlCa_IsoTrack

- **Reduction** from ~160 triggers (for $\mathcal{L} \sim \text{E32}$)

- Startup trigger menu as small as possible (for $\mathcal{L} \sim \text{E29}$).

- Additions can be proposed before data taking.



Analysis approval guidelines

■ Requirements:

(This is now official)

- ✓ The analysis has a very **clear idea of what precisely is measuring**.
- ✓ The **data samples** used are **well defined**.
- ✓ The analysis has a clear, **well-defined set of triggers**.
- ✓ The analysis has a **clear data-driven method** for its measurement, backgrounds & efficiencies.
- ✓ **Physics objects** are standard ones – **okayed** by corresponding **POG**.
- ✓ **Theoretical** key parameters varied **within “acceptable ranges”**.
- ✓ Analysis must demonstrate the **necessity of each of its cuts**.
- ✓ **Systematic uncertainties** are included.
- ✓ Standard **statistical tools** should be utilized.
- ✓ The documentation should be complete: **Analysis Note** describes all aspects of the analysis.
- ✓ **Physics Analysis Summary = real doc**, ready to be shown outside CMS.



CMS Physics activities

- We should continue the **900 GeV analyses – to completion**
 - Start **analyses** with the (arriving soon) **10 TeV samples**
 - Continue work on **early publications**
 - we should have full **drafts ahead of time**
 - **New analysis approvals:**
 - Rumours say that LHC may actually start on Sept'09 (!?)
 - Determine which results to update & to make public (afresh).
 - **Provide list of analyses that should be re-activated** for approval.
 - Priority should be given to the **10 TeV** samples (with the new software). We must minimize (absolutely) the 1_6 analyses.
 - Priority to younger collaborators (theses, limited-term positions).
- High standards (next slide) !**



CMS Publications

■ PAS must be built **via cvs repository**:

Example:

```
cd ~/scratch0/TDR/notes
setenv CVSROOT :kserver:isscvs.cern.ch:/local/rep/tdr.
eval `./tdr runtime -csh`
tdr --style pas b HIN-08-001
```

■ **Conference reports:**

- Must be submitted **via iCMS (CINCO in future)** before submitting to conference proceeds.
- **Referees** will be assigned automatically (1 convener + 1 other).
- **1-3 days to review**. Accept or request a new draft with comments.



CMS-HI physics: group activities

- **Physics Objects:**

- High- & low- p_T tracking

- Muons

- electrons/gamma

- Jets, b-jets

- Centrality

- Reaction plane

- **Physics Analysis:**

- $dN/d\eta$, dN/dp_T of ch. hadrons

- Quarkonia

- Jets, gamma-jet

- Inclusive Z, Z+jet

- B \rightarrow J/ ψ , D-mesons

- Ultrapерipheral collisions

- **Online:**

- Detectors/DAQ/DQM

- L1 Trigger

- HLT

- **Software/Computing:**

- GEN

- SIM-DIGI

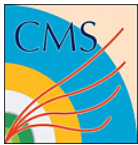
- RECO

- Rel-Val.

- Data Prod.

- **Generators:**

- HYDJET/PYQUEN, ...



CMS-HI Physics Objects

- **Reco algorithms:** development/comissioning/validation/tag/performance
 - **Tracking / Vertexing** (low & high p_T) – Ferenc/Krisztian, Vasu/Christof
 - **Jets:** Pileup subtraction with different jet finders – Irina/Marguerite/...
JetPlusTrack (JPT) – Irina/Marguerita/Olga with help of Fedor
 - **Muons** (L3 & offline reco) – Olga/Dong-Ho/Ji-Hyun
 - **Photons** – Jen-Yie
 - **Reaction-centrality** – Yetkin Yilmaz
 - **Reaction-plane/v2** - Gyulnara/Sergey
 - **b-tagging** – (...)
- **Status reports** (including, ideally, plan for **tags/releases**) in
EAST/WEST meetings
- **Participation** in corresponding **CMS-POG** meetings/hypernews.



CMS-HI Physics Analysis

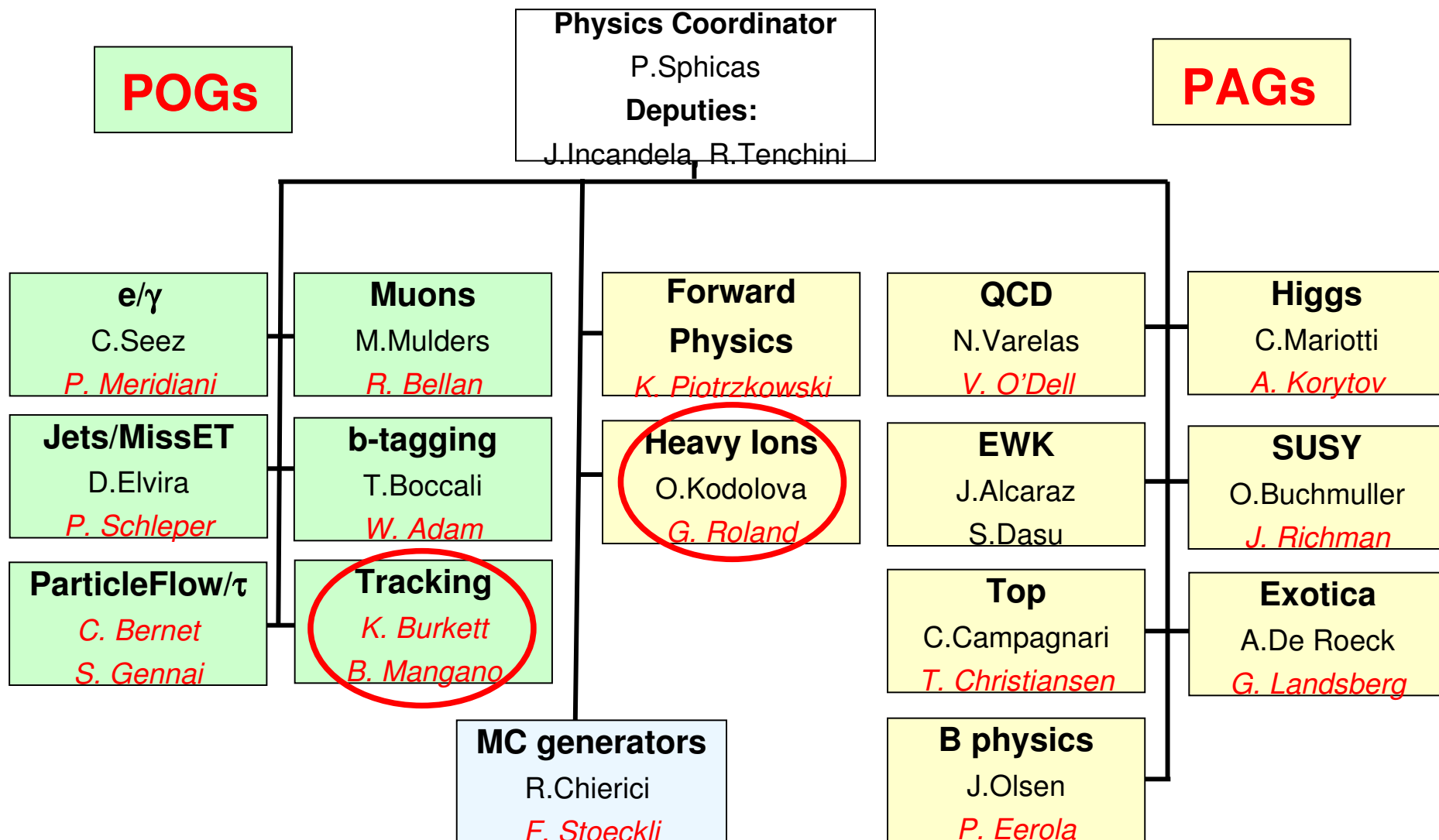
■ Ongoing Pb-Pb physics analysis:

- $dN/d\eta$, dN/dp_T – UIC / Budapest
- $QQ\bar{q}$ – Olga/Marc / Korea /
UCDavis / Lisbon, ...
- $Z \rightarrow \mu\mu$ – Mumbai / UCDavis
- $Z(\gamma^*)$ - jet – LANL / Moscow
- $B \rightarrow J/\psi$ – Mumbai / Korea
- D mesons – Auckland
- Jets – Marguerite / Irina
- Gamma (-jet) – Yen-Jie
- Elliptic flow – Moscow/Auckland
- UPC Upsilon – Mumbai /CERN
- High- p_T ϕ -corrs. – Vasu

- Status reports in EAST/WEST meetings. Update CADI status
- Committing code in official CMS-HI repository dirs.
- Participation in associated p-p efforts (corresponding PAGs)
- More help (people) welcomed !

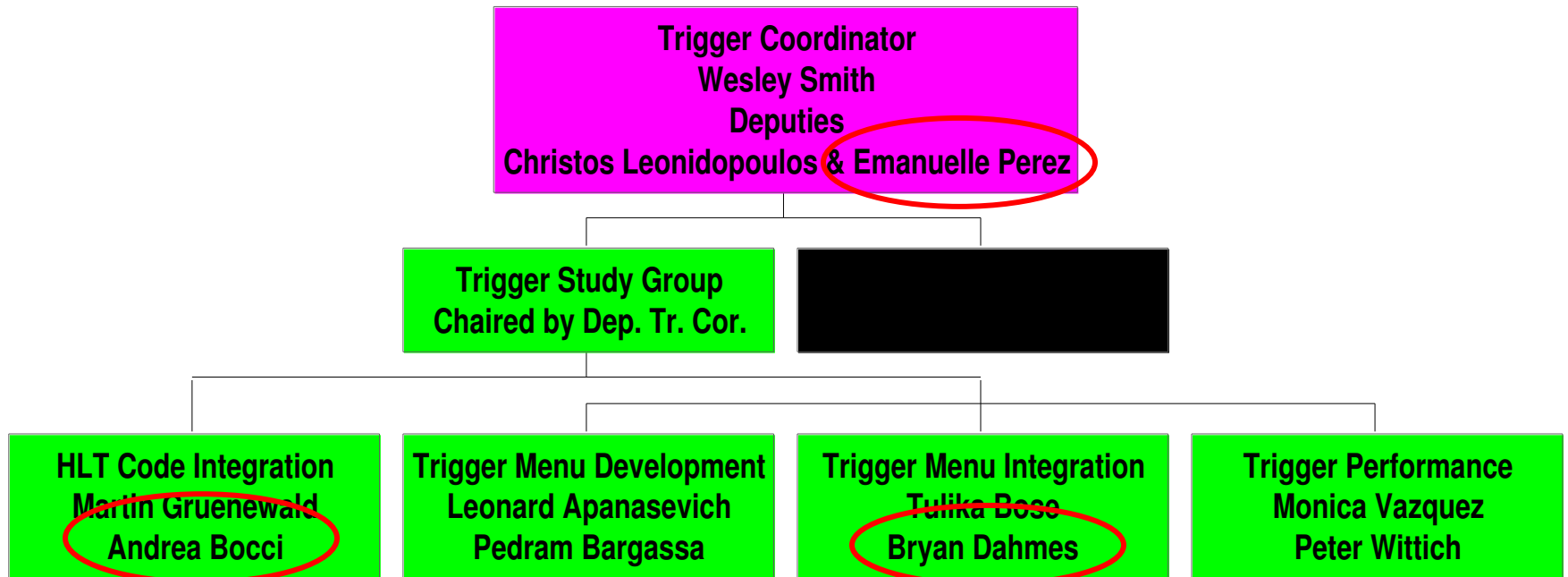


CMS Physics organization (from Jan 2009)



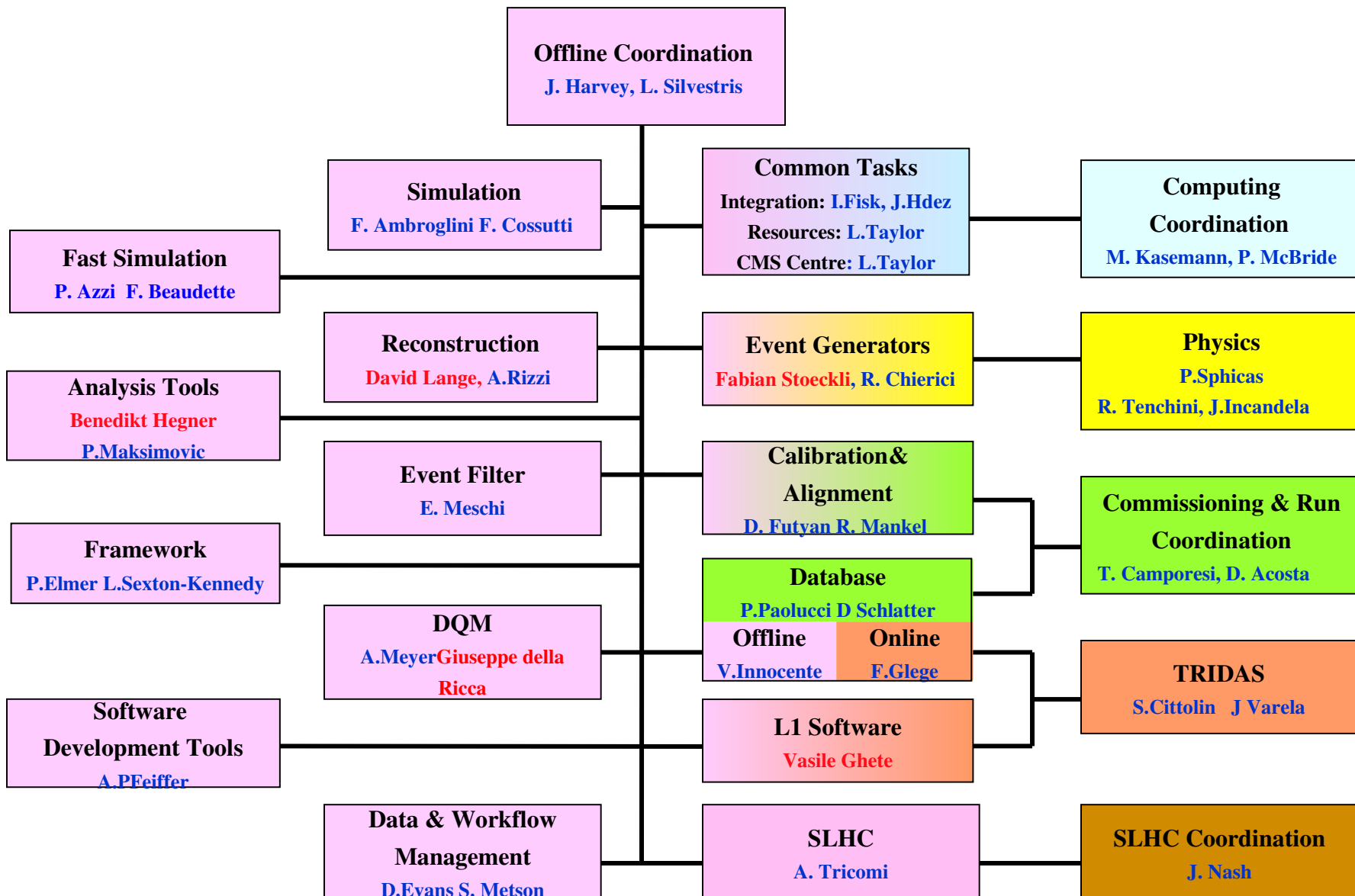


CMS Trigger coordination



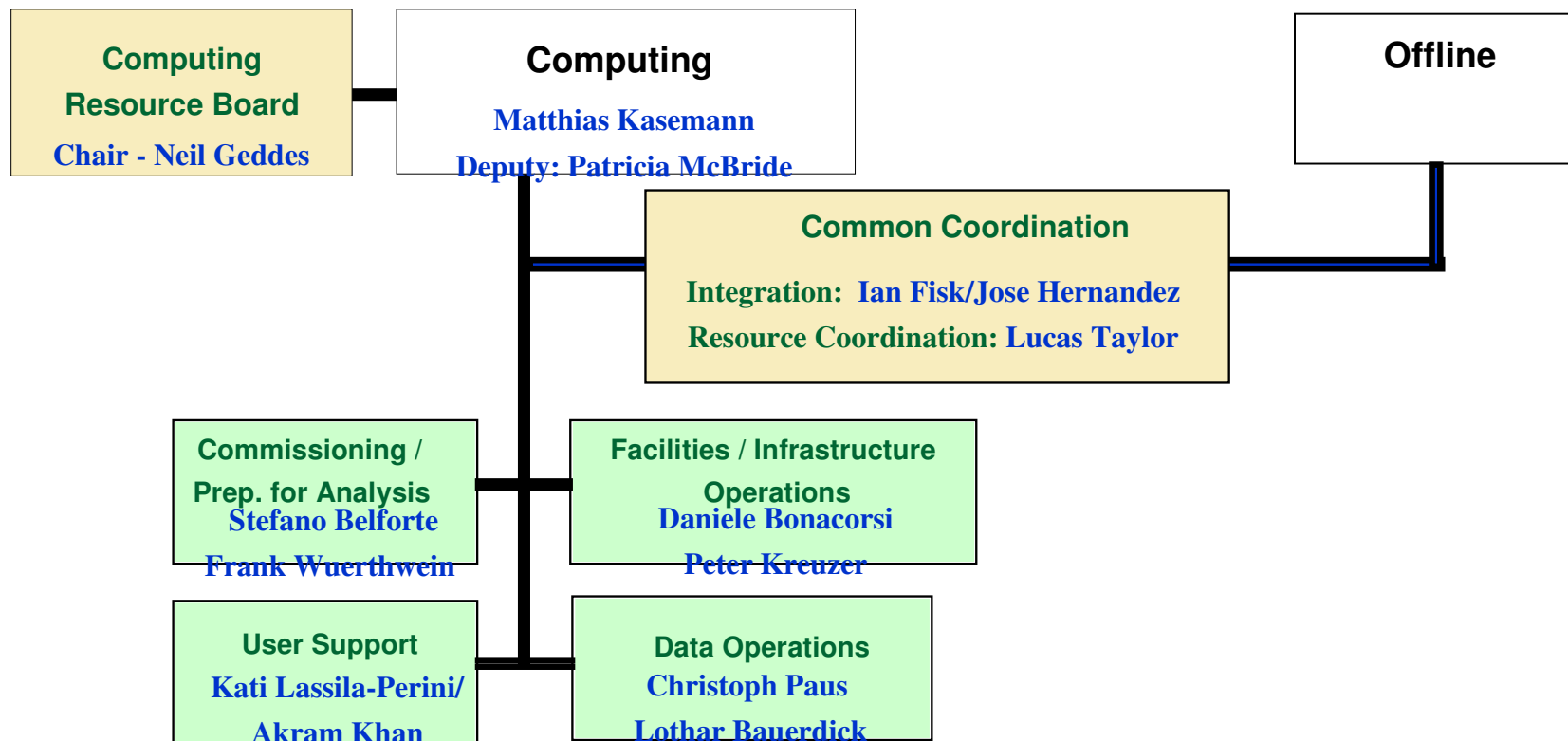


CMS Offline organization





CMS Computing organization (2008-2009)



Status:

- **no changes** foreseen in the moment
- we may have to change in **User Support** and **Data Operations**



List of early physics papers (I)

- QCD

- Hadron Spectra
- Underlying Event
- Dijet Azimuthal Decorrelation
- Event Shapes
- Dijet Production Ratio
- Dijet Angular Distributions
- Inclusive Jet Production
- Photon cross section

- B physics

- Onia
- B x-section
- b-bbar correlations?

- EWK

- W/Z (in electrons) cross section
- W/Z (in muons) cross section
- Parton distribution functions
- W/Z+jet production (electrons/muons combined)

- TOP

- Dileptons
- Semileptonic



List of early physics papers (II)

- Searches
 - Z'
 - Z' to ee
 - Z' to $mumu$
 - W'
 - to enu
 - to $munu$
 - Dijets
 - Leptoquarks
 - Black holes
 - HSCP
 - GMSB...
- Higgs:
 - No reach for SM in 2008. So mostly preparatory figures
- SUSY:
 - Early look at jets and MET



Analysis updates (reminder)

- (1) The **Conveners inform the ARC** members of the intention to make an update & of the schedule for presentation in the WG
- (2) The **presentation in the WG** is formally announced as an update a week in advance.
- (3) The **analysers** should produce something in **written** where they make clear what are the **changes and the new PAS with the updated results**.
- (4) The **ARC looks at the documentation** and discuss with the conveners and proponents.
- (5) **The ARC proposes** to physics coordination if the update requires a new full procedure or if it can be decided upon by the ARC and conveners.



Presentation of unapproved material

- Two new cases are now regulated:
 - (1) Public dissemination of unapproved/uncontroversial physics results may be allowed at a **national or regional meeting by a student** on the details of the work he or she has personally performed.
 - (2) Requirements for CMS members who present **physics results obtained with CMS software** (typically full or fast sim) in the context of a **workshop with theorists or other non-CMS** members.
- In both cases, **physics coordination & relevant conveners have to be informed and have to approve** the presentation.
- More details will be posted soon.



CMS-HI Physics Objects

- People responsible of **developing/maintaining Pb-Pb reco algos**:

Tracks (Low/High p_T)

Ferenc Sikler / Vasu Chetluru

Muons

Olga Kodolova / DongHo Moon & Haidong Liu/Ji Hyun Kim

Jets

Marguerite Tonjes / Irina Vardanyan

e/gamma

Yen-Jie Lee

Vertexing

Gabor Veres / Krisztian Krajczar

Centrality

Yetkin Yilmaz / Sertac Orzturk

Reaction plane

Sergei Petrushanko / G. Ebbuyova

...

- More help (people) is needed.
- We'll be (or have been) contacted to **organize plan of work** (e.g. muon meeting on 22nd of May)
- Should start: (i) committing **code in official cvs areas** (see next slide), (ii) **documenting** algos (twiki)



CMS-HI group representatives

- Simulation:
 - Release & Validation Y Yilmaz
 - ZDC Detector E. Garcia
 - CASTOR Detector P. Katsas
- MC generators: I. Lokhtin / C. Mironov / Y. Yilmaz
- Trigger & Online Sel.:
 - L1 trigger R. Hollis / D. Hofman
 - HLT C. Roland / G. Roland
- Reconstruction:
 - Physics objects:
 - Tracks (Low/High pT) V. Chetluru / F. Sikler
 - Muons O. Kodolova,
Dong Ho Moon & Haidong Liu
 - Jets M. Tonjes / I. Vardanyan
 - e/gamma Yen-Jie Lee
 - Centrality Y. Yilmaz / S. Orzturk
 - Reaction plane S. Petrushanko / G. Ebbuyova
 - Analysis Tools / PAT: Y. Yilmaz

CMS-HI representatives
must **participate** in all
PAT, GEN, TRIGG meetgs
& **report**, if needed, to
CMS-HI hypernews/meetg.



CMS-HI software organization

[More in Yetkin's talk]

<https://twiki.cern.ch/twiki/bin/view/CMS/CmsHiSoftware>

- CVS area for **Physics Objects**:

[**EDProducers** code]

e.g. muon, gamma, reaction plane, centrality, ...

CMSSW/RecoHI : Reconstruction Modules

CMSSW/DataFormats/HeavyIonEvent : Reconstructed Data

- CVS area for **Physics Analysis**:

[**EDAnalyzers** code & configs.]

CMSSW/HeavyIonsAnalysis/

e.g. QQbar, elliptic-flow, $Z \rightarrow \mu\mu$, dijets, ...

Group goals for 2008



➤ CMS-HI activities around 3 main axis:

1. Fully incorporating HI objects into CMSSW:

- Add HYDJET/PYQUEN & other HI gens. to Physics Validation & Prod. chain
- All physics objects fully available/validated/maintained in CMSSW:
tracks, jets, muons, b-jet tagg., photons, electrons, centrality, v_2 , ...
- All ongoing/missing physics analyses completed:
Z, b-jets, $Z(\gamma^*)$ - jet, $B \rightarrow J/\psi$, D/B mesons, prompt photons, (di)electrons, ...

2. Participation to first p-p run:

- Contributions to QCD studies
 - Benchmark measurements for Pb-Pb
- } ($dN/d\eta$, dN/dp_T h^\pm , jets, quarkonia, ...)

3. Detector / DAQ / Trigger (L1, HLT) readiness for Pb-Pb:

- Confirmation of detector/DAQ functioning/configuration (tracker, calorimeters, muon spectrometers, ...) under expected Pb-Pb conditions
- Finalize L1 & HLT trigger-menus for Pb-Pb.



p-p 900 GeV run

- **Early run** at 900 GeV (injection energy) some time in **Sept.**(?)
- Goals:
 - Align&Calibration.
 - 1st physics paper(s) out of these (short) commissioning run.
- “Task force” group (QCD-physics oriented):
<https://twiki.cern.ch/twiki/bin/view/CMS/PhysicsWith900GeV>
- Summary presentation by Paolo Bartalini (22nd of May):
<http://indico.cern.ch/materialDisplay.py?contribId=4&sessionId=4&materialId=slides&confId=33828>
- 900-GeV exercise (GEN-SIM-PROD) to be started soon
- **CMS-HI people** actively participating: dN/dp_T , $dN/d\eta$, L1, ..., other ideas

HI Physics analyses



The priority is to finalize ongoing analyses:

- **dN/deta** – UIC / Budapest
 - QQbar porting to CMSSW - Olga/Marc/Ko
 - **$Z \rightarrow \mu\mu$** – Dipanwita
 - **b-jets** – Gopika
 - **$B \rightarrow J/\psi$** – Mumbai / Korea
 - **$Z(\gamma^*)$ - jet** – Camelia
 - **Direct photons** – Kenan Sogut /... ?
 - **Cosmic-rays** (strangelets) – Panos Katsas
 - ...
- ✚ Development / tag (these & previous analyses) needs to go into official **CMSSW/HeavylonAnalysis** subdirs. (empty now ?!).
- ✚ Each group to report the 2008 work-plans in this (& next) meetg.



CSA08 skims – Tier2 locations

- We have proposed the following skims-location in “CMS-HI” Tier-2 sites:

1. **B-physics, onia, QCD-2mu** --> **RDMS** T2, **MIT** T2

According to the current DBS2 page (~ 1 TB)

2. **photonjets** --> **MIT** T2, **Vanderbilt** T3

From JetMET skims.

According to the current DBS2 page (< 1 TB)

3. **QCD** jets --> **MIT** T2

onejet (from JetMET skims)

According to the current DBS2 page (10-15 TB)

- Anything else ... ?



CMS-HI 2008 p-p work plan (I)

- Main interest of CMS-HI analysers: ref. “QCD vacuum” data for Pb-Pb.
- No real “priorities” apart from “first CMS paper”.
- Inclusive particle production

First-day (“1st CMS paper”):

(i) dN/dp_T , $dN/d\eta$ for charged hadrons [Budapest (2), CERN (1), UIC (2)]

1 pb-1:

(ii) dN/dp_T identified charged (π, K, p ,) & neutral (V0's) hadrons [Budapest (2)]

(iii) $dN/d\eta$ & multiplicity distrib. for h^\pm [Budapest (2), UIC (2), MIT (1-2 people).

(iv) $dN/d\eta$, dN/dp_T fwd particle prod [Athens(2), Kansas(1), CERN (1), Cukurova(2), Adana(2)]

(v) $dN/d\phi$ “reaction-plane” & azimuthal anisotropies [MSU (3), Cukurova (2)]



CMS-HI 2008 p-p work plan (II)

1-100 pb-1:

- Inclusive QQbar production
(vi) $dN/d\eta$, dN/dp_T for J/Psi, Upsilon
[Korea Univ.(2), MSU(3), Lyon(1), CERN(1), Vanderbilt(1), BARC(1), Lisbon(1)]
- Inclusive Z production
(vii) $dN/d\eta$, dN/dp_T , ... [BARC (1)]
- Jet production
(viii) $dN/d\eta$, dN/dp_T jet production [MSU (3), MIT (1-2), Maryland (1)]
(ix) Z+jet [LANL (1), BARC (1), MSU (1)]